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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,940	05/10/2001	David E. Baraff	022972-00008	4048

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EXAMINER	
MCCARTNEY, LINZY T	

ART UNIT	PAPER NUMBER
2671	11

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/851,940	BARAFF ET AL.	
	Examiner	Art Unit	
	Linzy McCartney	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 January 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-11,13,14,16,23 and 25-30* is/are rejected.

7)☒ Claim(s) *3,12,15 and 24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 13, 14, and 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Volino et al., "Accurate Collision Response on Polygonal Meshes" in view of Volino et al., "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces".

a. Referring to claim 1, "Accurate Collision Response on Polygonal Meshes" discloses providing a plurality of objects represented by a plurality of meshes, with each of said plurality of objects being represented by one of said plurality of meshes and each of said meshes being formed by a set of vertices, where a set of pairs of vertices of said set of vertices define a set of edges (page 1, column 1, paragraph 2; page 8, column 2, paragraph 5; Figure 12); checking all edges of said meshes to determine if said set of edges of said meshes intersect with any of said plurality of meshes (page 8, column 2, paragraph 2). "Accurate Collision Response on Polygonal Meshes" does not explicitly disclose tracing an intersection path formed by intersection of said edges with any of said plurality of meshes and determining which vertices of said meshes are contained within said intersection path <u>and setting a polarity of each vertex contained within said intersection path to indicate that said vertex is contained within said intersection path,</u>

wherein a polarity of a vertex is set based upon a number of disconnected regions formed by said intersection path. "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" discloses tracing an intersection path formed by intersection of said edges with any of said plurality of meshes and determining which vertices of said meshes are contained within said intersection path and setting a polarity of each vertex contained within said intersection path to indicate that said vertex is contained within said intersection path, wherein a polarity of a vertex is set based upon a number of disconnected regions formed by said intersection path (page 8, paragraphs 2-3). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the method of "Accurate Collision Response on Polygonal Meshes" by tracing an intersection path formed by intersection of said edges with any of said plurality of meshes and determining which vertices of said meshes are contained within said intersection path and setting a polarity of each vertex contained within said intersection path to indicate that said vertex is contained within said intersection path, wherein a polarity of a vertex is set based upon a number of disconnected regions formed by said intersection path taught by "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces". The suggestion/motivation would have been to have a very robust simulation system that can handle complex situations involving wrinkling ("Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces", page 2, paragraph 1).

b. Referring to claim 2, "Accurate Collision Response on Polygonal Meshes" does not explicitly disclose said step of determining which vertices of said meshes are contained within said intersection path comprises examining vertices of a mesh that contains said intersection path within a certain distance from a particular edge of said intersection path and characterizing said vertices to determine which vertices of said meshes are contained within said intersection path. "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" discloses said step of determining which vertices of said meshes are contained within said intersection path comprises examining vertices of a mesh that contains said intersection path within a certain distance from a particular edge of said intersection path and characterizing said vertices to determine which vertices of said meshes are contained within said intersection path (page 9, paragraph 5). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the method of "Accurate Collision Response on Polygonal Meshes" by determining which vertices of said meshes are contained within said intersection path comprises examining vertices of a mesh that contains said intersection path within a certain distance from a particular edge of said intersection path and characterizing said vertices to determine which vertices of said meshes are contained within said intersection path as taught by "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces". The suggestion/motivation would have been to have a very robust simulation system that can handle complex situations involving wrinkling ("Collision and Self-Collision

Detection: Efficient and Robust Solutions for Highly Deformable Surfaces", page 2, paragraph 1).

c. Computer program of claims 13-14 perform the steps recited in method claims 1-2; therefore they are similar in scope and are rejected under the same rationale.

d. Claim 27 is rejected with the rationale of the rejection of claim 1.

e. Referring to claim 28, "Accurate Collision Response on Polygonal Meshes" discloses wherein the first portion and the second mesh portion are portions of a mesh representing an object (Fig. 13).

f. Referring to claim 29, "Accurate Collision Response on Polygonal Meshes" discloses wherein the first mesh portion is a portion of a first mesh representing a first object and the second mesh portion is a portion of a second mesh representing a second object (Fig. 12).

g. Claim 30 is rejected with the rationale of the rejection of claim 1.

3. Claims 5, 17, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Accurate Collision Response on Polygonal Meshes" in view of "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" as applied to claims 1 and 13 above further in view of U.S. Patent No. 5,515,489 to Yaeger.

a. Referring to claim 5, the modified method of "Accurate Collision Response on Polygonal Meshes" as applied to claim 1 above meets the limitations recited in claim 5 except the modified method of "Accurate Collision Response on Polygonal Meshes" does not explicitly disclose setting a polarity of each of vertex to comprises associating a first color with vertices of the first mesh contained with said intersection path and associating

a second color with vertices of the second mesh contained within said intersection path. Yaeger discloses setting a polarity of each of vertex to comprises associating a first color with vertices of the first mesh contained with said intersection path and associating a second color with vertices of the second mesh contained within said intersection path (column 12, lines 54-67). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the method of "Accurate Collision Response on Polygonal Meshes" by setting a polarity of each of vertex to comprises associating a first color with vertices of the first mesh contained with said intersection path and associating a second color with vertices of the second mesh contained within said intersection path as taught by Yaeger. The suggestion/motivation would have been to display the area of collision between two objects (Yaeger, column 12, lines 54-56).

b. Computer program of claim 17 performs the steps recited in method claim 5; therefore they are similar in scope and are rejected under the same rationale.

c. Referring to claim 25, "Accurate Collision Response on Polygonal Meshes" does not explicitly disclose displaying said objects on a computer display with vertices displayed in colors associated with the vertices. Yaeger discloses displaying said objects on a computer display with vertices displayed in colors associated with the vertices (column 12, lines 54-67).

d. Computer program of claim 26 performs the steps recited in method claim 25; therefore they are similar in scope and are rejected under the same rationale.

4. Claims 4, 6, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Accurate Collision Response on Polygonal Meshes" in view of "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" as applied to claims 1 and 13 above and further in view of United States Patent No. 5,444,838 to Kommrusch et al. (Kommrusch).

a. Referring to claim 4, the modified method of "Accurate Collision Response on Polygonal Meshes" as applied to claim 1 above discloses said intersection path is a self-intersection while the intersection path being contained in a single mesh ("Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces", page 2, paragraph 2 – page 3, paragraph 1). The modified method of "Accurate Collision Response on Polygonal Meshes" does not explicitly disclose said wherein setting a polarity of each vertex comprises associating a first color with each vertex that is contained within said intersection path when the intersection yields one region and wherein the intersection yields first and second disconnected regions, associating a second color with each vertex contained in said first disconnected region and associating a third color with each vertex contained in the second disconnected region. Kommrusch discloses wherein setting a polarity of each vertex comprises associating a first color with each vertex that is contained within said intersection path when the intersection yields one region (Fig. 15C and column 2, lines 34-44) Kommrusch discloses wherein the intersection yields first and second disconnected regions, associating a second color with each vertex contained in said first disconnected region and associating a third color with each vertex contained in the second disconnected

region when using two interfering polygons (Fig. 15B). It would have been obvious to one of ordinary skill in the art at the time of the invention to use different colors to for first, second, and third regions in a self-intersection. The suggestion/motivation for doing so would have been to distinguish different regions. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the method of "Accurate Collision Response on Polygonal Meshes" by setting a polarity of each vertex comprises associating a first color with each vertex that is contained within said intersection path when the intersection yields one region and wherein the intersection yields first and second disconnected regions, associating a second color with each vertex contained in said first disconnected region and associating a third color with each vertex contained in the second disconnected regions taught by Kommrusch. The suggestion/motivation for doing so would have been because it allows the user to check for interference at a specific location within the three-dimensional object or objects (Kommrusch, column 2, lines16-18).

b. Referring to claim 6, the modified method of "Accurate Collision Response on Polygonal Meshes" does not explicitly disclose displaying said objects on a computer display with vertices displayed in colors associated with the vertices. Kommrusch discloses displaying said objects on a computer display with vertices displayed in colors associated with the vertices (Abstract, Fig. 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the method of "Accurate Collision Response on Polygonal Meshes" by displaying said objects on a computer display with vertices colored as said vertices have been set as

taught by Kommrusch. The suggestion/motivation for doing so would have been because it allows the user to check for interference at a specific location within the three-dimensional object or objects (Kommrusch, column 2, lines16-18).

c. Computer program of claims 16 and 18 perform the steps recited in method claims 4 and 6 therefore they are similar in scope and are rejected under the same rationale.

5. Claims 7, 9, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Accurate Collision Response on Polygonal Meshes" in view of "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" further in view of Rossignac et al., "Interactive Inspection of Solids: Cross-sections and Interferences" (Rossignac).

a. Referring to claim 7, "Accurate Collision Response on Polygonal Meshes" discloses providing a plurality of objects represented by a plurality of meshes with each of said plurality of objects being represented by one of said plurality of meshes and each of said meshes being formed by a set of vertices (page 1, column 1, paragraph 2; page 8, column 2, paragraph 5; Figure 12). "Accurate Collision Response on Polygonal Meshes" does not explicitly disclose determining an intersection path formed by intersections between said objects setting a polarity of each vertex contained within said intersection path based upon a number of disconnected regions formed by said intersection path; selecting a particular vertex of said set of vertices bound between surfaces of said objects and closer to one of said surfaces, where said surfaces have defined insides and outsides and said particular vertex; determining whether any vertices inside of said surfaces have

their polarities set; and indicating the said particular vertex is pinched when any vertices inside of said surfaces have their polarities set. "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" discloses determining an intersection path formed by intersections between said objects setting a polarity of each vertex contained within said intersection path based upon a number of disconnected regions formed by said intersection path (page 8, paragraphs 2-3). Rossignac discloses selecting a particular vertex of said set of vertices bound between surfaces of said objects and closer to one of said surfaces, where said surfaces have defined insides and outsides and said particular vertex; determining whether any vertices inside of said surfaces have their polarities set; and indicating that said particular vertex is pinched when any vertices inside of said surfaces have their polarities set (page 357, column 2, paragraph 2 - page 358, column 1, paragraph 1; Figs. 2 and 9). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the method of "Accurate Collision Response on Polygonal Meshes" by determining an intersection path formed by intersections between said objects setting a polarity of each vertex contained within said intersection path based upon a number of disconnected regions formed by said intersection path; selecting a particular vertex of said set of vertices bound between surfaces of said objects and closer to one of said surfaces, where said surfaces have defined insides and outsides and said particular vertex; determining whether any vertices inside of said surfaces have their polarities set; and indicating the said particular vertex is pinched when any vertices inside of said surfaces have their polarities set as taught by "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly

Deformable Surfaces" and Rossignac. The suggestion/motivation would have been to have a very robust simulation system that can handle complex situations involving wrinkling ("Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces", page 2, paragraph 1) and to highlight interference between objects (Rossignac, Abstract).

b. Referring to claim 9, "Accurate Collision Response on Polygonal Meshes" does not explicitly disclose displaying said objects on a computer display with vertices <u>displayed in colors associated with the vertices</u> such that the intersection and pinching of said objects is <u>visually displayed</u>. Rossignac displaying said objects on a computer display with vertices <u>displayed in colors associated with the vertices</u> such that the intersection and pinching of said objects is <u>visually displayed</u> (Fig. 9). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the method of "Accurate Collision Response on Polygonal Meshes" by displaying said objects on a computer display with vertices <u>displayed in colors associated with the vertices</u> such that the intersection and pinching of said objects is <u>visually displayed</u> as taught by "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" and Rossignac. The suggestion/motivation would have been to have a very robust simulation system that can handle complex situations involving wrinkling ("Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces", page 2, paragraph 1) and to highlight interference between objects (Rossignac, Abstract).

c. Computer program of claims 19 and 21 perform the steps recited in method claims 7 and 9 therefore they are similar in scope and are rejected under the same rationale.

6. Claims 8 and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over "Accurate Collision Response on Polygonal Meshes" in view of "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" further in view of Rossignac as applied to claims 7 and 19 above further in view of Jeff Lander "Skin Them Bones: Game Programming for the Web Generation" (Lander).

a. Referring to claim 8, the modified method of "Accurate Collision Response on Polygonal Meshes" as applied to claim 7 above meets the limitations recited in claim 8 except "Accurate Collision Response on Polygonal Meshes" does not explicitly disclose constraining motion of said pinched particular vertex when motion in said computer animation is simulated. Lander discloses constraining motion of said pinched particular vertex when motion in said computer animation is simulated (page 12, column 1, paragraph 3 – column 2, paragraph 2; Figs. 3 and 6). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the method of "Accurate Collision Response on Polygonal Meshes" by disclose constraining motion of said pinched particular vertex when motion in said computer animation is simulated as taught by Lander. The suggestion/motivation for doing so would have been to avoid the mesh folding in on itself (Lander, page 12, column 2, paragraph 3).

b. Computer program of claim 20.perform the steps recited in method claim 8 therefore they are similar in scope and are rejected under the same rationale.

7. Claims 10 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Accurate Collision Response on Polygonal Meshes" in view of "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" further in view of Lafleur et al., "Cloth Animation with Self-Collision Detection" (Lafleur).

a. Referring to claim 10, "Accurate Collision Response on Polygonal Meshes" discloses providing a plurality of objects represented by a plurality of meshes, with each of said plurality of objects being represented by one of said plurality of meshes and each of said meshes being formed by a set of vertices (page 1, column 1, paragraph 2; page 8, column 2, paragraph 5; Figure 12). "Accurate Collision Response on Polygonal Meshes" does not explicitly disclose positioning said objects at some time t to provide one frame of said computer animation; determining an intersection path formed by intersections between said objects setting a polarity of each vertex contained within said intersection path based upon a number of disconnected regions formed by said intersection path; setting a simulated force between vertices of said at least one simulated object based on polarity set for said vertices of said at least one simulated object; and advancing the computer animation to a time t + Δt and simulating motions of said objects using said simulated force to simulate motions of said at least one simulated object. "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" discloses determining an intersection path formed by intersections between said objects setting a polarity of each vertex contained within said intersection path based upon a number of disconnected regions formed by said intersection path (page 8, paragraphs 2-3). Lafleur discloses where at least one of said objects is an animated

object and at least one of said objects is a simulated object (Abstract); positioning said objects at some time t to provide one frame of said computer animation (page 6, paragraphs 5-7); setting a simulated force between vertices of said at least one simulated object based on the polarity set for said vertices of said at least one simulated object (page 3, paragraph 1-2); advancing the computer animation to a time $t + \Delta t$ and simulating motions of said objects using said simulated force to simulate motions of said at least one simulated object (page 3, paragraph 1-2; page 4, paragraph 3). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the method of "Accurate Collision Response on Polygonal Meshes" by disclose positioning said objects at some time t to provide one frame of said computer animation; analyzing intersections between said objects and setting a polarity of each of a plurality of vertices contained in an intersection path created by an intersection of said plurality of meshes; setting a simulated force between vertices of said at least one simulated object based on polarity set for said vertices of said at least one simulated object; and advancing the computer animation to a time $t + \Delta t$ and simulating motions of said objects using said simulated force to simulate motions of said at least one simulated object as taught by "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" and Lafleur. The suggestion/motivation would have been to have a very robust simulation system that can handle complex situations involving wrinkling ("Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces", page 2, paragraph 1) and to overcome difficulties in collision response and detection (Lafleur, page 2, paragraph 4 – page 3, paragraph 1).

b. Computer program of claim 22 perform the steps recited in method claim 10 therefore they are similar in scope and are rejected under the same rationale.

8. Claims 11 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Accurate Collision Response on Polygonal Meshes" in view of "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" further in view of Lafleur as applied to claims 10 and 22 above further in view of Kommrusch still further in view of Yaeger.

a. Referring to claim 11, the modified method of "Accurate Collision Response on Polygonal Meshes" as applied above does not explicitly disclose including said intersection path is a self-intersection with the intersection path contained in a single mesh, setting a polarity of each vertex contained within said intersection path comprises associating a first color with each vertex contained within said intersection path when the intersection yields one region and when the intersection yields first and second disconnected regions, associating a second color with each vertex contained in said first disconnected region and a third color with each vertex contained in the second disconnected region or when said intersection path is an intersection between a first mesh and a second mesh setting a polarity of each vertex contained in said intersection path comprises associating the second color with each vertex of the first contained within said intersection path and associating a third color with each vertex of the second mesh contained within said intersection path. Kommrusch discloses setting a polarity of each vertex comprises associating a first color with each vertex contained within said intersection path when the intersection yields one region (Fig. 15C and column 2, lines

34-44) Kommrusch discloses wherein the intersection yields first and second disconnected regions, associating a second color with each vertex contained in said first disconnected region and associating a third color with each vertex contained in the second disconnected region when using two interfering polygons (Fig. 15B). It would have been obvious to one of ordinary skill in the art at the time of the invention to use different colors to for first, second, and third regions in a self-intersection. The suggestion/motivation for doing so would have been to distinguish different regions. Yaeger discloses when said intersection path is an intersection between a first mesh and a second mesh setting a polarity of each vertex contained in said intersection path comprises associating the second color with each vertex of the first contained within said intersection path and associating a third color with each vertex of the second mesh contained within said intersection path (column 12, lines 54-67). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to further modify the method of "Accurate Collision Response on Polygonal Meshes" by including when said intersection path is a self-intersection with the intersection path contained in a single mesh, setting a polarity of each vertex contained within said intersection path comprises associating a first color with each vertex contained within said intersection path when the intersection yields one region and when the intersection yields first and second disconnected regions, associating a second color with each vertex contained in said first disconnected region and a third color with each vertex contained in the second disconnected region or when said intersection path is an intersection between a first mesh and a second mesh setting a polarity of each vertex contained in said

intersection path comprises associating the second color with each vertex of the first contained within said intersection path and associating a third color with each vertex of the second mesh contained within said intersection pathas taught by Kommrusch and Yaeger. The suggestion/motivation for doing so would have been because it allows the user to check for interference at a specific location within the three-dimensional object or objects (Kommrusch, column 2, lines16-18) and to display the area of collision between two objects (Yaeger, column 12, lines 54-56).

b. Computer program of claim 23 perform the steps recited in method claim 11 therefore they are similar in scope and are rejected under the same rationale

Response to Arguments

9. Applicant's arguments filed 1/30/04 have been fully considered but they are not persuasive. Applicant argues that the cited references fail to teach the polarity of a vertex is set based upon a number of disconnected regions formed by an intersection path. However, note that Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" teaches placing vertices into different contact regions (i.e., setting polarities of vertices) based upon the number of disconnected regions formed by an intersection path (Figs. 7 and 8. Note that the number of regions used to place the vertices is based upon the disconnected regions). The argument that the method of "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" eventually sets the collisions to a common orientation does not change the fact that initially the vertices are placed into different contact regions based upon the number of disconnected regions formed by an intersection path.

Allowable Subject Matter

10. Claims 3, 12, 15, and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Linzy McCartney** whose telephone number is **(703) 605-0745**. The examiner can normally be reached on Mon-Friday (8:00AM-5: 30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mark Zimmerman**, can be reached at **(703) 305-9798**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

ltm
April 15, 2004

MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600